Smart Solutions: "Master Class" – Part 3

- Designing & Engineering Smart Solutions -

Dr David E. Probert
VAZA International

Designing & Engineering Smart Security Solutions

1 –Review of Master Class – Parts 1 & 2	**2 –Team Task: *"Design Smart Solutions"***	**3 – Form Teams & Choose Market Sector**
4 – Smart Security for Banking/Finance	**5 – Smart Security for Government**	**6 – Smart Security for Airports/Transport**
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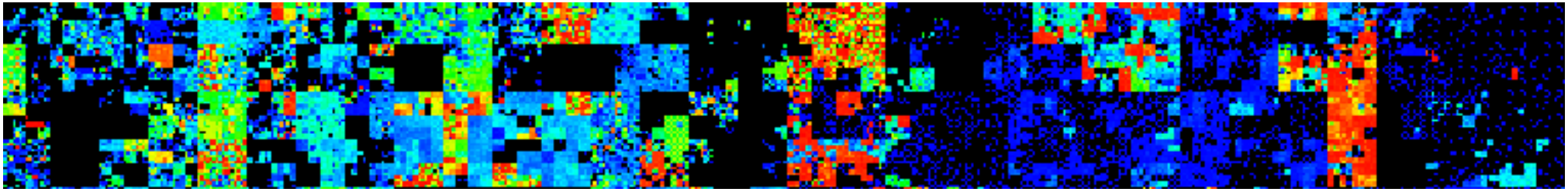

Review of "Master Class" – Theory & Practice

- ***Theory:*** In the "Master Class" - *theory,* we briefly reviewed the recent history of cybernetics, AI, simulation & smart systems.
- ***Smart Genes:*** We then discussed the principles behind "Smart Systems" and defined the foundational ICT "Smart Genes"
- ***ICT Foundation:*** We listed the advanced ICT Technologies that form the toolkit for the implementation of "Smart Solutions"
- ***Practice:*** In the "Master Class" - *practice,* we discussed the potential ways in which "Smart Solutions" are applicable to the Critical Market Sectors of the Armenian National Economy.
- ***Design:*** In this final "Master Class" - *design,* we focus upon the design of ***"Smart Security Solutions"*** for Critical Sectors. The design of "Smart Governance" & "Smart Economic Services" can be engineered using similar principles from "Smart Systems".

Basic ICT "Genes" for Smart Systems

- Intelligent Systems, either Artificial or Organic are based on just a few shared common organisational principles that include:
  1) ***Space-Time Awareness:*** Location (GPS) & Real-Time Clocks
  2) ***Learning, Adaptation & Self-Organisation:*** Real-Time Intelligence
  3) ***Massive Memory & Storage:*** Local & Remote Cloud Storage
  4) ***Sustainable Security :*** Embedded Smart Security – *Everywhere!*
  5) ***Scalable Networked Architecture:*** Smart Architectures will need to scale in space & time from micro cells to macro solutions
  6) ***Decision Focus:*** "Knowledge Lens" for Data Mining & "Big Data" from Social Networks, Search & On-Line Commerce
  7) ***Systems Integration:*** Cyber and Physical Solutions & Operations

……Advanced ICT Solutions now provide ALL these "Genetic" Functions!

ICT Foundations for Smart Systems

- Smart Systems require a wide diversity of functions & features just like "living organic cells". Advanced ICT now provides many existing and emerging smart options:
  - ***Networks:*** High-Speed Giga Byte Networking: Physical, Mobile & Wi-Fi
  - ***Virtualisation:*** Multi-Threaded Processors & System Virtualisation
  - ***Massive Storage:*** Internal, External & "Cloud" Storage, with Data Mining
  - ***Semantic Web:*** Led by W3C – "Smart Web" with linguistic understanding
  - ***Cybersecurity:*** Real-Time Security for O/S & Applications Software
  - ***Architecture :*** Scalable Architecture Solutions for Software Platform
  - ***Interface:*** Intelligent User Interface: Touch & Body Control
  - ***Standards:*** Conformance to International Standards (ISO/IEEE)
  - ***Location:*** Location Aware (GPS) & Environmental Sensors/Feedback
  - ***Immersive Media:*** Augmented Reality (AR) for Immersive Real/Virtual Worlds
  - ***Social Media & Search:*** Both are now generic global ICT service capabilities
  - ***Smart Mobile Media:*** At the heart of new Business Models & Architectures
- ***The Internet Protocol – TCP/IP (1975 – Vint Cerf & Robert Kahn) - is itself an adaptive networking protocol with dynamic routing, transmission and congestion control***

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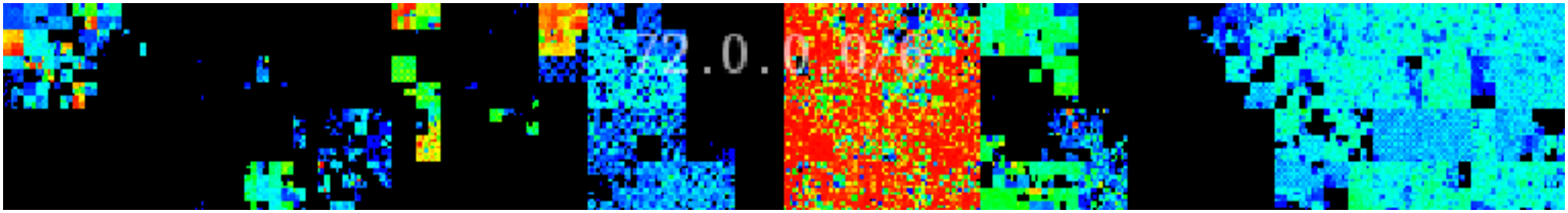

Task: *"Design Smart Security Solution"*

- ***Team Task:*** The best way to really understand the theory & practice is to understand a short team task
- ***Smart Security:*** Propose team focus upon smart security solutions for key sector such as banking, energy or government
- ***References:*** Suggest that you review "Smart Security" Training Materials: www.valentina.net/DigiTec2012/SmartSecurityV2.pdf

….Designing Smart Solutions using the Smart ICT Toolkit can only be taught through professional training & "live" customer experience!

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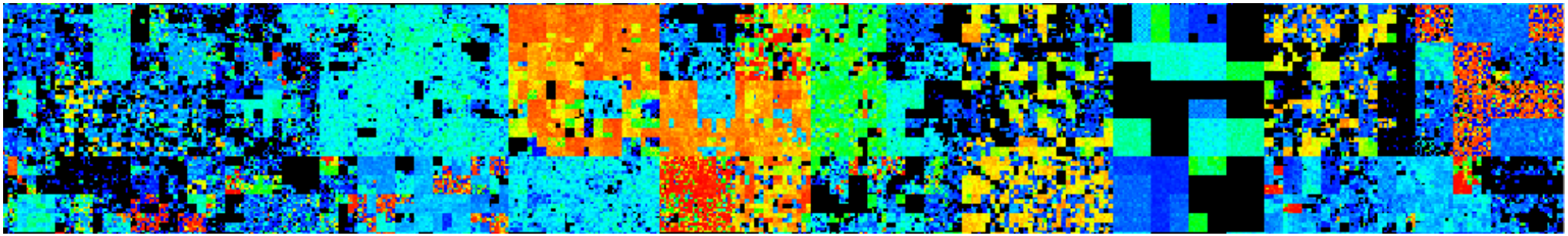

Form Teams & Choose Business Sector

- Suggested Business Sectors for Smart Security:
  - Banking and Finance
  - Government
  - Airports and Transportation
  - ICT, Telecommunications and Mobile
  - Energy and Utilities

…..Choose a business sector with which you have some personal experience in your professional career!

"Master Class" – "Smart Solutions & Business Architectures"

- Designing Smart Security Solutions -

- Team Worksheet – Smart Security Solutions (Integrated Cyber & Physical Security)

  - ***Task 1*** – Choose Sector: Banking, Government, Transport, Telecomms, Energy
  - ***Task 2*** - Identify and Discuss the Potential Physical & Cyber Threats to your Sector
  - ***Task 3*** – Evaluate the Impact and Economic Damage of such Threats & Risks
  - ***Task 4*** – Brainstorm the Practical Smart Security Solutions to Combat these Risks
  - ***Task 5*** – Structure and Prioritise the chosen Solutions for the Critical Sector
  - ***Task 6*** - Write a short presentation script & slides as CSO to "sell" your programme

……Focus on practical solutions and think about the most efficient ways in which they can be implemented with the technical and operational resources at your disposal!

Designing Smart Security Solutions for Critical Sectors

- *Suggested Time Allocations for Task Actions: 90mins* -

1 – Task Assignment: Choose your Critical Service Sector: ***Government, Banking and Finance Telecommunications, Transport, Energy***	**Task 2 – Define Threats: Cyber & Physical**	**Task 2 – Define Threats: Cyber & Physical**
Task 3 – Evaluate the Potential Impact & Economic Damage from your list of Threats	**Task 4 – Discuss Management Actions to Combat & Defend against these Threats**	**Task 5 – Structure & Prioritise Smart Security Solutions for your Critical Sector**
Task 6 – Complete the Sector Cybersecurity Smart Security Programme for the Short & Mid-Term: 2012-2013	**Task 7– Prepare Short 10 Min Presentation of Smart Security Action Plans**	**Task 7 – Prepare Short 10min Presentation of Smart Security Action Plans**

Note: ***Each Task Time Segment = 10Minutes***

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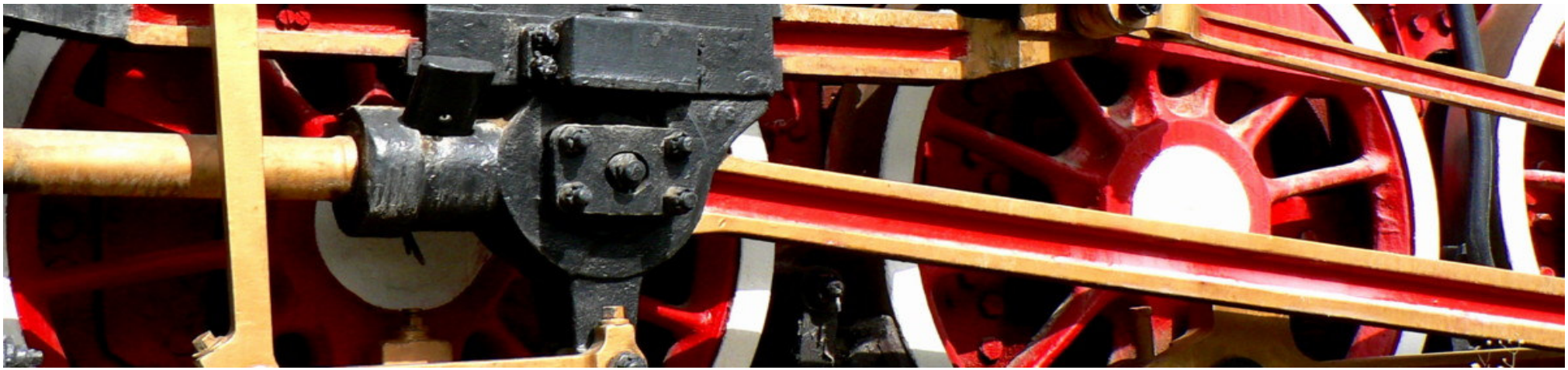

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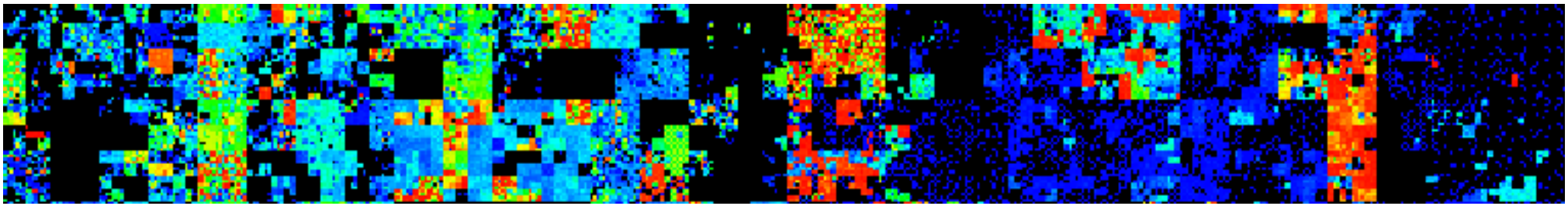

Task Description: Banking/Finance Sector

1) You have just been appointed as the CSO (Chief Security Officer) for a major National Armenian Financial Institution with both retail & investment operations

2) Your task is to prepare a report and presentation for the Board of Management with recommendations on the technical and operational actions that should be taken across the Financial Group to provide security against cybercriminal attacks

3) Assume that the Bank includes a large national retail network of local branches and ATM machines, as well as on-line banking operations. Also assume that the investment banking operations are networked with several other major global banking networks and that stocks, bonds & commodities are traded in real-time

4) There have already been cybercriminal attacks on bank accounts & transactions in the past year and you are asked by the CEO to ensure that any future attacks are immediately detected, maybe with an in-house CERT, and any losses minimised

……Consider all the potential cyber threats and prioritise your action plan for the Board

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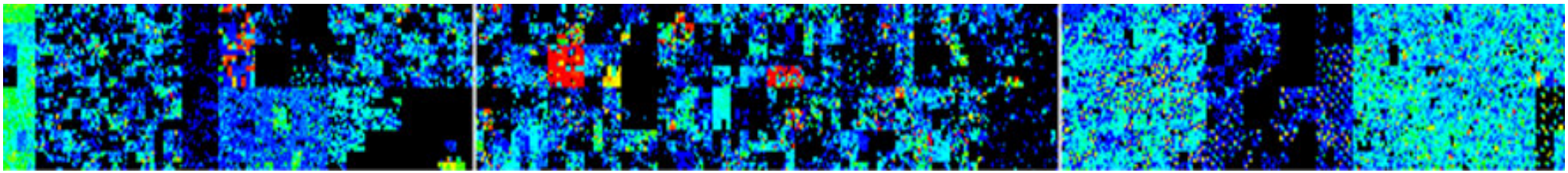

Task Description: Government Sector

1) You have just been appointed as the new CSO (Chief Security Officer) for the Government working within the Prime Minister's Cabinet Office with top-level responsibility for cybersecurity across all aspects of Government.

2) Your task is to prepare a report & short presentation to the Cabinet regarding the technical and operational actions that should be taken across Government in order to provide an adequate defence against cyber threats & potential attacks.

3) Assume that the Government comprises around 20 Ministries including Foreign Office, Home Office, Security, Defence, Transportation, Finance, Justice, Energy, Environment, Healthcare and Industry, as well as Regional Administrations

4) There is already a Government Data Network and various ICT computer centres and databases that are not yet secured against cyber threats & attacks

…..Plan your security priorities, and prepare a practical cybersecurity action plan

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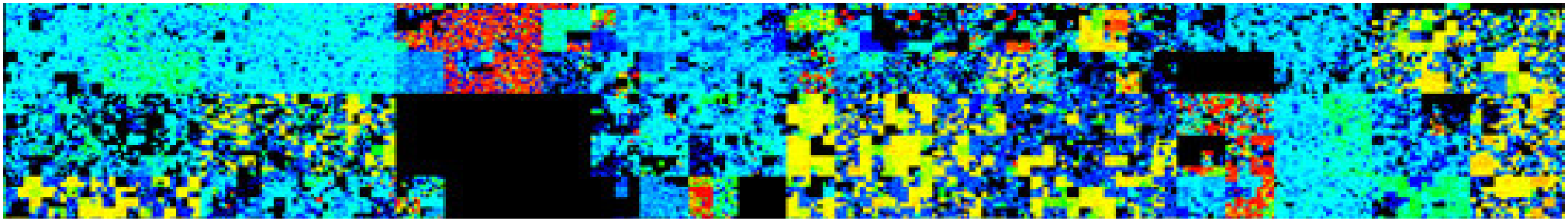

Task Description: Transport/Airports Sector

- You have just been appointed the CSO (Chief Security Officer) for the country's largest international airport (Yerevan – Zvartnots - EVN), including both passenger and cargo operations.

- Your task is to prepare a report and presentation to the Board of Management for the Airport with recommendations and action plan for the upgrading of all aspects of security across the airport/port operational and ICT facilities.

- Assume that the Airport has both airside and landside operations, with multiple domestic and international airlines flying routes to an intensive schedule. The ICT assets include the real-time air traffic control, passenger & cargo screening systems, staff and vehicle access, and the computerised dispatching network and baggage handling network.

- You are responsible as CSO for both the operational security and associated security staff as well as all the cybersecurity aspects of the airport operation.

…Consider all the possible cybercriminal and cyberterrorist threats to the airport facilities and prioritise your action plan to minimise risks from potential attacks

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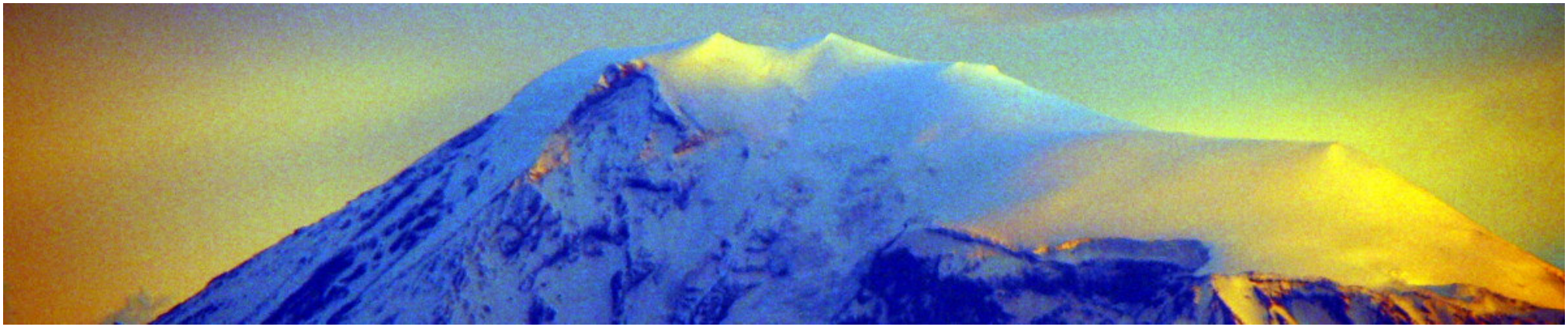

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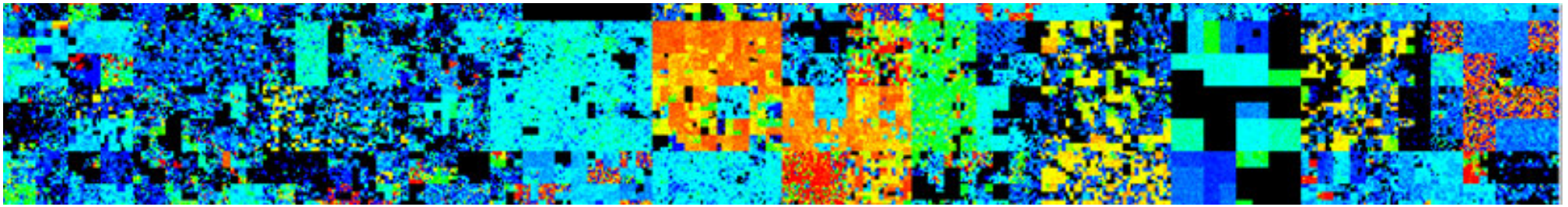

Task Description: Telecomms/Mobile Sector

- You have just been appointed as the CSO (Chief Security Officer) for the National Telecommunications or Mobile Networking Carrier in Armenia
- Your task is to prepare a full report and presentation to your Board of Management with recommendations for upgrading all aspects of cybersecurity, specifically focusing upon the technical and operational procedures & measures
- Assume that the National Telecomms and/or Mobile Operations comprises a national distributed radio and landline network with a range of traditional telecommunications and broadband "new generation" IP technology switches & servers.
- You are responsible for ALL aspects of network security including the private leased line (VPN) networks for the government & large enterprises, as well as the telecommunications ISP operations which includes Hosted eCommerce WebSites, VoIP & Gateways & Routers to other Regional and International Networks

…Consider all the threats and prioritise your actions in order to minimise the risks and potential damage from future cyber attacks on the national telco network

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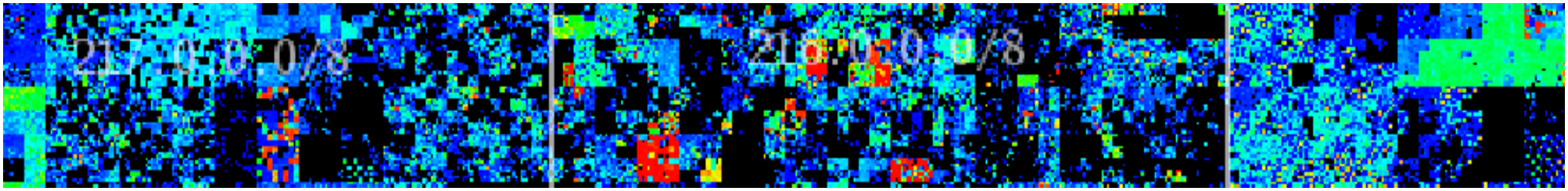

Task Description: Energy/Utilities Sector

- You have recently been appointed as the CSO (Chief Security Officer) for the National Armenian Energy and Power Grid which provides most of the nation's energy

- Your task is to prepare a report and presentation for the Board of Management with recommendations and action plan for upgrading all aspects of security with respect to the National Power Grid and its regional centres and operations

- Assume that the National Power Grid and Company has several large power stations (non-nuclear) and distribution network across cities, towns & villages. The ICT computer facilities include all the power station process control networks & applications, as well as the 24/7 real-time management of energy (electricity & gas flow) through the national power grid to business & end-users

- You are responsible as CSO for both the technical aspects of ICT cybersecurity as well as operational security for the power stations, offices and other facilities

….Consider all the possible cyberthreats and cyberterrorism that could impact the national grid and prioritise a practical plan that minimises the risk of attack, and reduces the collateral damage and disruption following any major power failure

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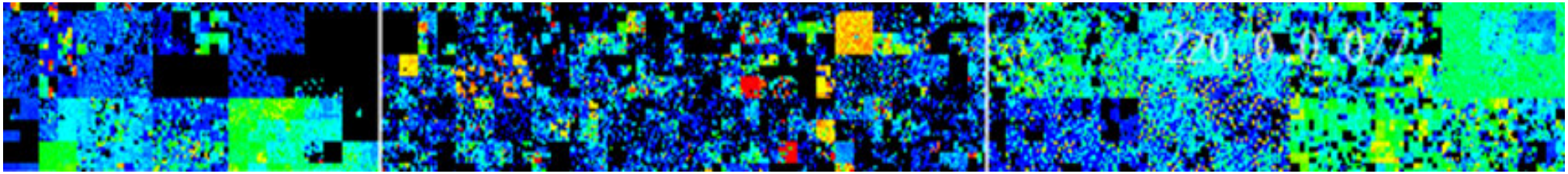

Team Discussion: Designing Smart Security Solutions

Schedule: Task Presentations = 90mins

Group 1 = Government (15mins)	**Group 2 = Banking/Finance (15Mins)**
Group 3 = Telecomms/Mobile (15Mins)	**Group 4 = Transport or Energy (15Mins)**

Group Task Discussion (10Mins)	**Review On-Line Resources and Next Steps for Personal Study on "Smart Security"**	**Final Discussion & Wrap-Up**

"Designing & Engineering Smart Solutions"

DigiTec Business Forum – Yerevan, Armenia

Thank-You!...

Master Class Materials & Slides:

www.Valentina.net/DigiTec2012/

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Thank you for your time!

Professional Profile - *Dr David E. Probert*

- ***Computer Integrated Telephony (CIT)*** – Established and led British Telecom's £25M EIGER Project during the mid-1980s' to integrate computers with telephone switches (PABX's). This resulted in the successful development and launch of CIT software applications for telesales & telemarketing

- ***Blueprint for Business Communities*** – Visionary Programme for Digital Equipment Corporation during late-1980's that included the creation of the "knowledge lens" and "community networks". The Blueprint provided the strategic framework for Digital's Value-Added Networks Business

- ***European Internet Business Group (EIBG***) – Established and led Digital Equipment Corporation's European Internet Group for 5 years. Projects included support for the national Internet infrastructure for countries across EMEA as well as major enterprise, government & educational Intranet deployments. Dr David Probert was a sponsoring member of the European Board for Academic & Research Networking (EARN/TERENA) for 7 years (1991 ➔1998)

- ***Supersonic Car (ThrustSSC)*** – Worked with Richard Noble OBE, and the Mach One Club to set up and manage the 1st Multi-Media and e-Commerce Web-Site for the World's 1st Supersonic Car – ThrustSSC – for the World Speed Record.

- ***Secure Wireless Networking*** – Business Director & VP for Madge Networks to establish a portfolio of innovative fully secure wireless Wi-Fi IEEE802.11 networking products with technology partners from both UK and Taiwan.

- ***Networked Enterprise Security*** - Appointed as the New Products Director (CTO) to the Management Team of the Blick Group plc with overall responsibility for 55 professional engineers & a diverse portfolio of hi-tech security products.

- ***Republic of Georgia*** – Senior Security Adviser – Appointed by the European Union to investigate and then to make recommendations on *all* aspects of IT security, physical security and BCP/DR relating to the Georgian Parliament.

- ***UN/ITU*** – Senior Adviser – Development of Cybersecurity Infrastructure, Standards, Policies, & Organisations in countries within both Europe & Americas

Dr David E. Probert is a Fellow of the Royal Statistical Society. He has a 1st Class Honours Degree in Mathematics (Bristol University) & PhD from Cambridge University in Self-Organising Systems (Evolution of Stochastic Automata) , and his full professional biography is featured in the Marquis Directory of Who's Who in the World: 2007-2012 Editions.

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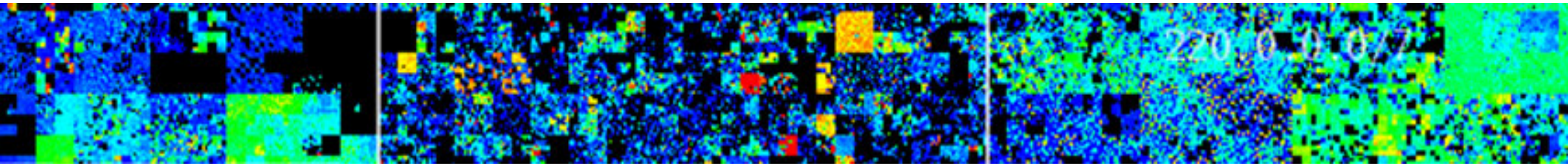
BACK-UP SLIDES



On-Line *"Smart"* Cybersecurity Resources

- ***ITU Cybersecurity Toolkits,*** Reports and Standards (www.itu.int)
  - ITU Cybercrime Toolkit & Cybercrime Guidelines for Developing Countries
  - ITU Toolkit on "Botnet" Mitigation – *Protection against Denial of Service Attacks*
  - ITU Self-Assessment Toolkit for CIIP – Critical Information Infrastructure Protection
  - ITU Technical Security Standards such as X.800 Series and the X.1200 Series
- ***Technical Publications*** on Cybersecurity from NIST, ISF, ISO, ENISA well as the Cybersecurity Organisations from national Governments
  - NIST – National Institute of Standards and Technology ("800" Security Series)
  - ENISA – European Network & Information Security Agency
  - ISF – Information Security Forum
  - ISO – International Standards Organisation
- ***Industry White Papers*** and Reports from the major ICT Cybersecurity Companies such as Symantec, Sophos, Kaspersky Labs and McAfee